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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 10/648,012
Filing Date: August 26, 2003
Appellant(s): WOOLFORK, C. EARL

Natu J. Patel
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 22 December 2007 appealing from the Office action mailed 23 July 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 2004/0223622 | Lindemann | 11-2004 |
| 4,970,637 | Sato | 11-1990 |
| 6,418,558 | Roberts | 7-2000 |

| | | |
|---|---|---|
| 5,946,343 | Schotz | 8-1999 |
| 5,790,595 | Benthin | 8-1998 |
| 6,678,892 | Lavelle | 1-2004 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 30, 53, 56 and 58** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 30 recites that the receiver uses embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal. However, Applicant's Fig. 1, shows a fuzzy logic detector (61) inside of the receiver unit (50). Receiver unit 50 is fully disclosed in Fig. 3, however, neither the specification, nor the drawings provide any detail as to how any fuzzy logic is used within the components of Fig. 3 to enhance detection of the unique user code.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 33, 34** and 37-38 are rejected under 35 U.S.C. 102(e) as being anticipated by Lindemann (U.S. Patent Application 2004/0223622).

Regarding **Claim 33**, Lindemann discloses:

A wireless digital audio system (Fig. 15B and Fig 17), comprising:

at least one audio source (Fig. 15B, 133, 134, 135);

at least one digital audio transmitter operatively coupled to said at least one audio source (Fig. 15B 131);

at least one audio receiver adapted for digital wireless communication with said at least one audio transmitter (Fig. 15B, 130 and Fig. 17 300)

each of said at least one digital audio transmitter and receiver being configured for code division multiple access (CDMA) communication (para 0075); and

at least one module adapted to audibly reproduce said processed CDMA signal, said CDMA communication configuration providing a user with independent audio

reproduction free of interference from other users or wireless devices (Fig. 15A; the speakers reproduce, which receive the audio without interference from the other speakers).

Regarding **Claim 34**, in addition to the elements stated in the rejection of claim 33, Lindemann further discloses:

At least one module adapted to amplify said processed CDMA signals (Fig. 17 element 301).

Regarding **Claims 37 and 38**, in addition to the elements stated above regarding claims 16 and 17, Lindemann further discloses:

audio source provides analog output in the approximate range of 20 Hz to 20 kHz (i.e. audible range produced by the tweeters and woofers in Fig. 1; provided by the audio source input)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**Claims 19 – 29 and 43 – 52** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemann (U.S. Patent Application 2004/0223622) in view of Sato (U.S. Patent 4,970,637).

Regarding **Claim 19**, Lindemann discloses:

A wireless digital audio system (abstract) comprising:

at least one audio source to produce an audio output representative of music (Fig. 5 digital audio sample data);

at least one digital audio transmitter operatively coupled to said at least one audio source (Figs. 4 and 5).11

Lindemann fails to explicitly disclose that the digital audio transmitter comprises:

a first analog low pass filter receiving audio input from said at least one audio source;

a digital low pass filter;

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters.

However, Lindemann does disclose inputting a digital audio signal. This signal must have been converted from the analog domain at some point in time. Further, Lindemann discloses a loudspeaker system for a stereo, stereos are well known to include inputs such as microphones which input an analog audio signal. Filtering and converting from analog to digital and filtering again is notoriously well known in the art. For example, see Sato Fig.1.

Modifying Lindemann's transmitter to accept an analog input signal and convert it for transmission in the digital domain as taught by Sato discloses:

a first analog low pass filter receiving audio input from said at least one audio source (Sato Fig. 1which receives an analog input);

a digital low pass filter (Fig. 1 element 3; Max filter 3 operates on a digital signal and thus can be considered a 'digital low pass filter');

an analog-to-digital converter (ADC) operatively coupled between said first analog and digital low pass filters (Sato element 2).

It would have been obvious to one of ordinary skill in the art to modify Lindemann to accept an analog signal from a device such as a microphone and use a well known method such as the method taught by Sato. One would have been motivated to use the conversion technique to reduce noise and other errors.

The combination further

a first encoder configured to reduce intersymbol interference (ISI) (Fig. 5 element 502 which is a Reed Solomon Encoder and Interleaver; it is known in the art to configure Reed Solomon encoding/interleaving to reduce ISI as is shown by Roberts 6,418,558. Reducing ISI is a desirable feature to any digital transmission);

a second channel encoder operatively coupled to said first encoder and adapted to reduce transmission errors(Fig. 5 element 500; para 35 which indicates 500 is used for error correction);

a digital modulator operatively coupled to said second channel encoder (Fig. 4 element 405 which includes a 'modulator' and 'DSSS spreader' which indicates these are two separate elements);

a phase shift key a module receiving output from said digital modulator and a unique user code bit sequence (i.e. status messages are included in the transmission frames to control speaker attributes such as speaker group; para 11; and also see paras 64 on discussing channel selection) and being configured for direct sequence spread spectrum (DSSS)communication, said PSK module transmitting a corresponding DSSS signal having said audio output representative of the music and the unique user code bit sequence (Fig. 4 element 405, DSSS spreader using DQPSK or DBPSK; which outputs the music stream along with the status messages).

Lindemann does not explicitly disclose DPSK as claimed, however, DPSK is a notoriously well known alternative for DQPSK. When designing a transmitter, one must balance many various factors and depending on the characteristics desired (number of bits transferred, complexity and arrangement of the constellation), one may decide to implement a DPSK method in place of a DQPSK or DBPSK method.

The combination further discloses:

at least one audio receiver configured for digital wireless communication with said at least one audio transmitter (Fig. 3),

said at least one audio receiver comprising:

a band pass filter (BPF) configured to process said transmitted DSSS signal (BPF not shown in Fig. 3, para 57 of Lindemann);

a direct conversion module receiving output from said BPF and being configured to capture the unique user code bit sequence embedded in said processed DSSS signal (Fig. 3 301-304; directly converts the received signal to be ready for despreading);

a digital demodulator adapted to process output from said direct conversion module (Fig. 3 element 305);

a Viterbi decoder operatively coupled to said digital demodulator and generating a corresponding digital output (Fig. 8, 800);

a source decoder processing said digital output from said Viterbi decoder and being configured to decode the digital signal encoded by said first encoder (Fig. 8, 802).

The combination fails to explicitly disclose a second analog low pass filter. However, it would have been obvious to provide an analog filter for the desired purpose of smoothing the analog output after a digital to analog conversion. Low pass filtering after a D/A is notoriously well known in the art, see Schotz 5,946,343 Fig. 7B element 218.

The combination further discloses:

a digital-to-analog converter (DAC) operatively coupled between said source decoder and said second analog low pass filter (Fig. 10 element 1005; the analog filter of Schotz being provided after the D/A), said second analog low pass filter generating the audio output representative of the music (i.e. see the above discussion of the second low pass filter); and

at least one module adapted to reproduce said audio output, said audio output representative of said music, if the unique user code bit sequence is recognized (i.e.

enabling a specific group of speakers; para 66) having been wirelessly transmitted from said at least one audio source to a user for private audio reproduction of said music without interference form other users or wireless devices (Fig. 1, the speakers, which receive the audio without interference from the other speakers; further certain groups can be enabled as shown in para 66 and thus can be enjoyed without interference from other speakers and thus can be considered to be private).

Regarding **Claim 20**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said BPF is a wideband BPF (i.e. the band pass filter left out of Fig. 3; para 53; wideband being met by any band that could be considered 'wide'; i.e. a variety of well known configurations and choices available)

Regarding **Claim 21**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said modulator is a 64-Ary modulator (para 36, the modulator uses M-Ary, it is notoriously well known that M can be a variety of numbers depending on the transmission scheme, 64 being one possible obvious choice).

Regarding **Claim 22**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said modulator is a 64-Ary modulator (para 36, the modulator uses M-Ary, it is notoriously well known that M can be a variety of numbers depending on the transmission scheme, 64 being one possible obvious choice; thus the demodulator must operate accordingly)

Regarding **Claim 23**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said generated audio output is in the approximate range of 20Hz to 20kHz (i.e. audible range produced by the tweeters and woofers in Fig. 1).

Regarding **Claim 24**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said spread spectrum signal is transmitted at about 2.4GHz via an omni directional antennal (para 89; omni directional antenna being one of many well known and obvious choices for an antenna such as the one used by Fig. 1).

Regarding **Claim 25**, in addition to the elements stated above regarding claim 19, the combination fails to explicitly disclose the remission power. However, it is notoriously well known to adjust the transmission power in order to achieve a desired transmission distance. It is well known and obvious that in some modifications/variations, a given distance for Lindemann may only require 100 milliwatts.

Regarding **Claim 26**, in addition to the elements stated above regarding claim 19, the combination further discloses:

Wherein said ADC is a 4-bit analog-to-digital converter (the number of bits in the Lindemenn system is adjustable as is indicated by para 36-48; 4 being one possible obvious variation/modification).

Regarding **Claim 27**, in addition to the elements stated above regarding claim 19, the combination fails to explicitly disclose wherein said at least one audio source is a portable player. However, Examiner takes official notice that portable audio players, such as CD or MP3 players that produce an analog audio output are notoriously well known in the art. It would have been obvious to add one to the combination to be able to play portable media on a home entertainment center such as the one in the combination.

Regarding **Claim 28**, in addition to the elements stated above regarding claim 19, the combination fails to explicitly disclose wherein said at least one audio reproducing module includes at least one headphone speaker. However, the device does include a transducer/speaker. It is notoriously well known in the art that it is obvious to substitute a headphone/earphone device in place of a speaker in the field of audio reproduction. This is typically done for a variety of reasons, including minimizing disturbance caused to others.

Regarding **Claim 29**, in addition to the elements stated above regarding claim 19, the combination further discloses:

wherein said BPF is operatively coupled to at least one antenna configured to receive said transmitted DSSS signal (BPF not shown in Fig. 3, para 57 of Lindemann).

Regarding **Claims 43, 44 and 49 – 52**, claims 43, 44 and 49 - 52 are met by the rejections of claims 19, 27 and 30 as stated above, specifically in claim 30 the amplification module taught by Lindemann.

Regarding **Claims 45 and 46**, in addition to the elements stated above regarding claims 43 and 44, Lindemann further discloses:

audio source provides analog output in the approximate range of 20 Hz to 20 kHz (i.e. audible range produced by the tweeters and woofers in Fig. 1; provided by the audio source input).

Regarding **Claims 47 and 48**, in addition to the elements stated above regarding claims 43 and 44, Lindemann does not disclose wherein at least one of said digital audio transmitter and receiver is battery powered. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the speaker reception portion of Lindemann battery powered. One would have been motivated to do

so to be able to place and use the speakers in an area where standard power supplies are unavailable (i.e. outdoors).

**Claims 30 – 32 and 53** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemann (U.S. Patent Application 2004/0223622) in view of Sato (U.S. Patent 4,970,637) in further view of Benthin (U.S. Patent 5,790,595)

Regarding **Claim 30**, in addition to the elements stated above regarding claim 19, the combination further discloses:

at least one module adapted to amplify said generated audio output (Fig. 10, 1007 and 1008).

The combination does not explicitly disclose that the receiver utilizes embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal. However, it is well known to use a fuzzy logic detection system in a receiver such as Lindemann's. Benthin discloses a receiver that determines soft data bits (Figure i, function of Figure 2) for additional decoding performance in communication with the received, demodulated signal (output of II) from a spread spectrum demodulator (II) (col. 2, lines 6-31 col. 5, lines 10-25).

Applying this to the receiver of the combination meets the limitation of the receiver utilizing embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal..

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the soft decision relevant components of Benethin as part of the encoding and signal reception parts of the system of the combination. The motivation behind such a modification would have been that the soft bit determining circuitry would have improved the reliability of the decision relating to the hard data bit equivalents of the received information, as is taught by Benethin.

Regarding **Claim 31**, in addition to the elements stated above regarding claim 30, the combination further discloses:

wherein said at least one audio amplifying module includes at least one power amplifier, said at least one power amplifier being configured to provide a low distortion audio signal output (Fig. 10, 1007 and 1008; para 73).

Regarding **Claim 32**, in addition to the elements stated above regarding claim 31, the combination further discloses:

wherein said at least one audio reproducing module includes at least one speaker, said at least one speaker receiving said low distortion audio signal output from said at least one power amplifier (Fig. 1, woofer and tweeter).

The combination fails to explicitly disclose that the speaker is a headphone speaker. However, it is notoriously well known in the art that it is obvious to substitute a headphone/earphone device in place of a speaker in the field of audio reproduction.

This is typically done for a variety of reasons, including minimizing disturbance caused to others.

Regarding **Claims 53**, claim 53 is met by the rejection of claim 30 as stated above.

**Claims 41 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindemann (U.S. Patent Application Publication 2004/0223622).

Regarding **Claims 41 and 42**, in addition to the elements stated above regarding claims 33 and 34, Lindemann does not disclose wherein at least one of said digital audio transmitter and receiver is battery powered. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the speaker reception portion of Lindemann battery powered. One would have been motivated to do so to be able to place and use the speakers in an area where standard power supplies are unavailable (i.e. outdoors).

**Claims 54 and 55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lavelle (U.S. Patent 6,678,892).

Regarding **Claim 54**, Lavelle discloses:

A wireless digital audio system (Fig. 1B), comprising:

an audio source to provide an audio signal representative of music (i.e. various inputs; col. 4 lines 30 – 40);

a batter powered transmitter (i.e. 510, while not clearly stated, either the entertainment device contains integrated batteries or a vehicle requires a battery to power the various electronic components) coupled to said at least one audio source and operative to transmit a code division multiple access (CDMA) communication signal having said audio signal representative of said music and an added unique user code (i.e. transmitter 510 is connected to the various audio sources in Fig. 1B; it uses CDMA technology as shown in col. 7; the audio data is superimposed onto a carrier frequency and then tuned into using the device via separate selection; this frequency is considered to read upon the unique user code, as it is unique and can allow use by one headphone as desired);

a battery powered audio receiver headphone set operative to receive the CDMA communication signal and audibly reproduce said audio signal representative of said music (headphones 152 and 154), if the unique user code is recognized (i.e. the device is tuned to the specific carrier frequency), to provide a user with private audio reproduction free of interference form other users of other wireless digital audio music systems in a shared space (col. 7 lines 25 – 33).

Lavelle does not explicitly disclose the audio source coming from an existing analog headphone plug. However, audio sources with headphone plugs are notoriously well known in the art (i.e. iPods etc). Lavelle discloses that other devices may be employed in accordance with the invention; col. 4 lines 35 – 40. It would have been

obvious to allow an input for various devices such as iPods and other analog head phone devices. One would have been motivated to do so to make the device compatible with a widely used portable interface thus allowing user to enjoy their devices within their automobile.

Regarding **Claim 55**, in addition to the elements stated above regarding claim 54 , Lavelle does not explicitly disclose the transmitter having a differential phase shift keying modulated signal. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use DPSK in Lavelle. Lavelle discusses that one of ordinary skill in the art will contemplate the various elements required to implement CDMA in an entertainment system according to the invention. When designing a transmitter, one must balance many various factors and depending on the characteristics desired (number of bits transferred, complexity and arrangement of the constellation), one may decide to implement a DPSK method to achieve a certain balance.

Regarding **Claims 57 and 59**, claims 57 and 59 are met by the rejections of claims 54 and 55 as stated above.

**Claims 56 and 58** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lavelle (U.S. Patent 6,678,892) in view of Benthin (U.S. Patent 5,790,595)

Regarding **Claims 56 and 58**, in addition to the elements stated above regarding claims 55 and 57:

The combination does not explicitly disclose that the receiver utilizes embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal. However, it is well known to use a fuzzy logic detection system in a receiver such as Lavelle's. Benthin discloses a receiver that determines soft data bits (Figure i, function of Figure 2) for additional decoding performance in communication with the received, demodulated signal (output of II) from a spread spectrum demodulator (II) (col. 2, lines 6-31 col. 5, lines 10-25).

Applying this to the receiver of the combination meets the limitation of the receiver utilizing embedded fuzzy logic to enhance detection of the unique user code.

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the soft decision relevant components of Benethin as part of the encoding and signal reception parts of the system of the combination. Lavelle discusses that one of ordinary skill in the art will contemplate the various elements required to implement CDMA in an entertainment system according to the invention The motivation behind such a modification would have been that the soft bit determining circuitry would have improved the reliability of the decision relating to the hard data bit equivalents of the received information, as is taught by Benethin.

**(10) Response to Argument**

In **section 1** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 112 1st paragraph should be reversed.

Appellant alleges first:

> First, there are multiple paragraphs directed to fuzzy logic detection embedded in receiver 50. The Appellant directs the board's attention to the entire specification but specifically to paragraphs [0010], [0013] and [0014] for detailed support of the fuzzy logic detection 4. Fuzzy logic is software that employs a set of rules. For example, in paragraph [0013], the specification states "fuzzy logic detection sub-system 61 may use a set of if-then rules." and;
>
> Paragraph [0014] provides explicit details related to the "rules" and the evaluation of such "rules." More importantly, FIG. 4 is provided to graphically illustrate features of the fuzzy logic detection and the basis of the evaluation of the rules. In fact, FIG. 4 is described as a "graph showing utilization of an embedded fuzzy logic coding algorithm."

Examiner agrees that these paragraphs discuss some sort of fuzzy logic detection system. Further, it's shown that this system is located in the receiver of Fig. 1. Appellant agrees that this receiver is fully disclosed in Fig. 3 (Appeal Brief pg 18). However, these portions discussed show various rules on how the fuzzy logic operates. It does not include any disclosure on this piece of this system as to how these rules operate in conjunction with the other pieces of hardware. Nor does it disclose what portion of hardware actually performs these operations. One of ordinary skill in the art reviewing this disclosure would notice there is some sort of fuzzy logic detection system taught. However, one would not understand how to implement it within the receiver. It

is merely out there on an island, no corresponding connections nor is its implementation in another piece disclosed.

Appellant further submits in section 1:

> The fuzzy logic detection sub-system 61 is shown in FIG. 1 and described as being associated with receiver 50. As acknowledged on page 3 of the FOA, the rejection states "receiver unit 50 is fully disclosed in Fig. 3." Hence, in view of the disclosure and drawings, Appellant has described the fuzzy logic detection sub-system 61 and how it is used to enhance detection of the unique user code.

As stated above, Appellant has disclosed a form of fuzzy logic detection. However, Appellant has failed to explicitly show how it is implemented within the receiver of Figs.1 and 3. One of ordinary skill in the art would not know how or where to implement this fuzzy logic within the receiver 50 as disclosed in Fig. 3. There is not disclosure on where the sub system receives data from or what it outputs it to, only that it performs some operations on data.

Appellant further submits in section 1:

> "First, as the Examiner realizes, multiple methods of implementing a fuzzy logic detector exist. Therefore a person skilled in the art can use any method of implementation to enable the claim. However, the more important issue is not how the fuzzy logic detector is implemented, but how the fuzzy logic algorithm operates and how the fuzzy logic detector interacts with the other elements, which is unmistakably described in the specification."

Examiner respectfully disagrees. Examiner submits that it is important how the fuzzy logic detector is implemented. Examiner submits that how the fuzzy logic

algorithm operates is disclosed in the specification, but how it interacts with the other elements, is not unmistakably described in the specification. Appellant has provided no location where the interaction is described. After multiple reviews of the specification, the Examiner is unable to find any location disclosing any interaction. Rather, it appears as though it is just an algorithm out in space, somewhere in this receiver. One of ordinary skill in the art would have no idea where to place this algorithm and logic within the device.

Appellant further submits in section 1:

> Second, the algorithm for the fuzzy logic detector was clearly laid out in the specification, as shown above. As the specification demonstrates, the fuzzy logic detector is used in the receiver 50 and a person skilled in the art would recognize that the detector is used somewhere after receiving the signal and before audio output. Additionally, there is no requirement that the fuzzy logic detector be discussed specifically in the drawings so long as the specification makes note of it.

Examiner respectfully disagrees. Appellant sufficiently sums up the enablement problem by stating "the detector is used somewhere after receiving the signal and before audio output." One of ordinary skill in the art would have no idea where to place this component or what component in Fig. 3 performs these operations. Appellant submits that it is used in receiver 50, but where is it implemented? Examiner agrees that one of ordinary skill in the art would understand that it is implemented somewhere after receiving the signal and before the audio output, but that is the crux of the problem. One would not know exactly where. Thus recreating the system would be

impossible for one of ordinary skill in the art. **Undue experimentation** would be necessary to figure out exactly where it would need to be implemented as it is not sufficiently disclosed. Where exactly would one place this software or hardware within the disclosure of Fig. 3?

Appellant further submits in section 1:

> Appellant is unclear as to why the Examiner views "software" as being different from "logic." Nonetheless, "if-then" rules are implemented in software. Many programming languages provide "if-then" syntax. Appellant is also at a loss as to how or why a fuzzy logic detector would be considered "a method."
>
> Appellant notes that a receiver is not just a hardware device such that it functions without any software. On the other hand, a receiver cannot be just software. Software must be executed by a processor having hardware properties. For example, a decoder is implemented using a set of instructions executed by a processor in accordance with various decoding standards or protocols.
>
> In general, a receiver marries hardware components such as a housing, resistors, capacitors, antenna, processors, etc. with software to carryout the receiving functions including, but not limited to, CDMA reception and user code detection. As disclosed by Appellant, the fuzzy logic detection is used to enhance the detection of a user code by the receiver, especially in a shared space environment with other users.

Examiner submits that the statement as to not being able to determine whether the fuzzy logic detection subsystem is hardware or software is part of the enablement problem. It is agreed by the examiner that if it is software, then it must have corresponding hardware to operate. If this is the case, then which portion of the receiver in Fig. 3 performs the fuzzy logic operations? If it is merely hardwired logic, then where is this hardware located within Fig. 3?

In **section 2/3** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 102(e) in view of Lindemann should be reversed.

Appellant argues in section 2/3 that Lindemann doesn't teach "independent audio reproduction free of interference from other users or wireless devices. But rather:

> Furthermore, Appellant observes that Lindemann does not mention interference or address the problem identified by Appellant and thus Appellant's solution to provide a user with independent audio reproduction free of interference from other users or wireless devices. Instead, Lindemann is directed to a digital wireless loudspeaker system and the delivery of signals to the speakers. Thus, Lindemann is not directed to a system capable of (1) providing a user with independent audio reproduction; and (2) reproduction free of interference from other users or wireless devices. By contrast, Lindemann simply provides a "loudspeaker system" where anyone can listen."

Examiner respectfully disagrees. Regarding the first issue of "independent audio reproduction," it appears as though Appellant is attempting to further narrow the claims within these statements. It appears as though Appellant is equating "independent audio reproduction" with a single person listening via headphone devices without others being able to listen. Examiner respectfully disagrees with this characterization of the claim. Lindemann does provide playback via a speaker system. Lindemann's system is capable of providing audio to specific speaker's in specific zones; para 66. For example, there may be two rooms A and B, each room may have 5 speakers. The device will send music to as few as 1 and as many as 5 to each of the rooms. The system will only enable the speakers in the zones desired by the user. It is respectfully submitted that a single user in any one of these zones enjoying audio reproduction alone, would meet the limitation of independent audio reproduction. For example,

assume a single user is located in zone A and another single user in zone B. Zone A and B would typically be separate rooms of a single family dwelling (i.e. kitchen and bedroom). The user in zone A would be enjoying music alone and separate from the user in zone B (i.e. independent).

Additionally, Lindemann does teach reproduction free of interference from other users or wireless devices, specifically wireless devices. The speakers in Lindemann sent status messages, these messages tell specific speakers within the system whether or not they should be enabled; para 66. For example, speaker x in Group A and speaker y in Group B are two separate speaker that will only be enabled when the particular status message corresponding to each individual speaker is activated. Activating speaker x will not interfere with the activation or reproduction of music of speaker y because they have specific messages corresponding to specific speakers. Thus, assuming both speaker x and y are active, if the user decides to deactivate speaker x, a status message will be sent to the entire system, it will be received by all of the devices, but only x will be deactivated. Y will remain on and will not be interfered with.

Appellant further states in section 2/3:

> The Advisory Action further asserts on page 3 and 4 that "Element (2) is clearly met by virtue of the fact that it is CDMA reproduction. CDMA's entire goal is to minimize interference to provide a clear transmission. The fact that the speakers decode status messages to determine whether or not to produce music as well as what to produce ... clearly meets the 'reproduction free of interference with other users or wireless devices.'"

Examiner submits that in addition to what was stated above regarding "reproduction free of interference from other user or wireless devices," the limitation is also met by virtue of the fact it is a CDMA transmission. A CDMA transmission is set up to ensure that a particular user or group of users will receive the transmission. This must occur, otherwise cell phone transmission which typically use CDMA would not operate properly.

The remaining arguments in section 2/3 are directed to the fact that Lindemann doesn't have multiple RF transmitters and thus can't correct the interference from multiple transmitters. It also states that Appellant's device contains multiple transmitters and corrects interference of communication sent from multiple transmitters.

However, this argument is irrelevant. First, Appellant's claim is directed only to "at least **one** digital audio transmitter." Thus only one transmitter is necessary to meet the claim. Further it is only necessary to correct the interference from one transmitter since it is the only one required in the claim.

Furthermore, Appellant's specification is completely silent as to multiple transmitters being present, let alone any disclosure as to how to correct interference amongst multiple.

As a result, while these problems (stated on pages 21 – 25 of the Appeal Brief) may exist in communication systems with multiple transmitters, the arguments are completely irrelevant due to the lack of limitations in the claims and disclosure in the specification.

It should also be noted that Appellant is attempting to characterize in section 2 the interference claimed is RF interference. However, the claims are not limited to this interference, nor does the disclosure limit the interference to RF interference.

In **section 4** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lindemann and Sato should be reversed.

Appellant first states in section 4:

> In addition to Lindemann and Sato (U.S. Patent No. 4,970,637), the rejection of Claim 19 also relies upon Roberts, et aL (U.S. Patent 6,418,558), and Schotz (U.S. Patent 5,946,343). Furthermore, the rejection of Claim 19 relies on numerous statements that various claimed elements in Claim 19 are notorious.

Examiner submits that the rejections do not rely upon the Roberts and Schotz references. Rather, notoriously well known modifications are shown (which have not been challenged during prosecution) by the Examiner, and then Roberts and Schotz are shown as evidentiary support. The rejection does not rely upon these references.

In this section, Appellant submits that the combination fails to disclose 1.) "for private audio reproduction of said music" or 2.) "reproduce said audio output representative of said music, if the unique user code bit sequence is recognized."

Regarding element 1.), Appellant states:

> There is nothing in Lindemann, the primary reference, to provide a user with private audio reproduction, such as via headphones... By contrast, Lindemann simply provides a "loudspeaker system" where anyone can listen; ...The word "private" does not appear anywhere in Lindemann or Sato. Furthermore, "private" does not appear in Schotz '343 or Roberts '558.

Examiner respectfully disagrees with this statement. As stated above in section 2, the private/independent audio reproduction is achieved by single users in separate rooms. Examples and further description is shown in the response to section 2/3.

Further Regarding element 1.), Appellant states:

> Page 5 of the Advisory Action asserts that the purpose of Lindemann is to provide music to multiple zones. Appellant's invention, on the other hand, among other things, provides private listening of different music to multiple individuals sharing the same space (i.e. room/zone).

Examiner somewhat agrees with this statement. While, Appellant's invention is disclosed as providing private listening to multiple individuals sharing the same space, this is not claimed. Since it is not specifically stated in the claim, it can not be considered to limit the claim language. No language is present regarding "multiple users" or "sharing the same space."

Further Regarding element 1.), Appellant states:

> Music devices enumerated in paragraph [0002] includes portable devices. Therefore, Lindemann does not disclose Appellant's system that provides different music privately to multiple individuals, where each user has her own receiver headphone and transmitter and is in the same shared space with other users.

Again, there are no claim limitations for "multiple individuals" or "in the same shared space with other users."

Regarding element 2.) Appellant states:

> Additionally, in Lindemann, the system does not transmit "music" with a "unique user code bit sequence." At best, Lindemann sends different channels (for stereo or surround sound) to different speakers and does not require "a unique user code bit sequence." Providing a "loudspeaker system" is at the heart of the Lindemann invention. By contrast Appellant's invention seeks to provide "private audio reproduction.' .... Private audio reproduction" is diametrically opposed to the operation of a "loudspeaker" system such as that of Lindemann.

Examiner respectfully disagrees. As shown previously, status messages are included in the transmission frames (i.e. audio transmissions) to control speaker attributes such as speaker group and speaker activation (abstract). Paragraph 35 further states that this status information is added to each digital audio frame 503. This is in direct contract to what Appellant is alleging. These status messages are meant to meet the unique user code limitation as they only permit playback by the activated speakers. Further, a user of the system must assign which groups and speakers are activated; para 64. Since these speakers are assigned by a user, and activated by status messages, the status messages can be considered produced by the user, and thus can be considered a unique user code (i.e. created by a user and unique to each individual speaker).

Appellant further states regarding element 2):

> Appellant's wireless digital audio music system utilizes Code Division Multiple Access (CDMA) to allow multiple wireless digital audio music system users to simultaneously share a finite amount of radio frequency spectrum. Lindemann utilizes CDMA to multiplex the audio spectrum (Lindemann, paragraph 0075 states "This corresponds to a Code Division Multiple Access (CDMA) method of multiplexing the multiple audio channels."). Moreover, Schotz does not mention CDMA anywhere. Therefore, any combination of Lindemann, Sato, Schotz or Roberts would not produce the Appellant's invention.

Again, Appellant is attempting to limit the device to show multiple users simultaneously sharing a finite amount of radio frequency spectrum. While Appellants invention may be able to do this, it is not positively recited within the claims. Thus, the argument is considered irrelevant.

Appellant further states regarding element 2):

> On page 8 of the FOA, the Examiner appears to be equating "unique user code bit sequence," as claimed by Appellant, to "status messages ... in the transmission frames to control speaker attributes such as speaker group." The FOA also directs Appellant to paragraphs [0011] and [0064]. However, Lindemann provides channel selection for various combinations of speakers or groups of speakers such as to provide, in one embodiment, a "full complement of six surround sound speakers." Lindemann is essentially silent on the use of or the need for a "unique user code bit sequence."
>
> However, the status message enables an individual speaker to select a particular channel from a set of channels contained in a single RF signal transmitted from a particular RF transmitter. (Lindemann, Claim 1 states "means for selecting one of the audio channels from the RF signal for broadcast" (emphasis added); Lindemann Claim 14 states "transmitting an RF signal including at least two audio channels of transmission data." (emphasis added)). Lindemann does not disclose the use of unique user codes to select between multiple RF signals. As discussed above, Lindemann does not discuss the problem of interference caused by multiple CDMA transmission sources in proximity of a CDMA receiver, and therefore does not discuss utilization and capture of unique user codes to select between multiple RF signals.

Examiner respectfully disagrees with this statement. Again, Appellant is stating that Lindemann does not teach a feature that is not positively claimed, specifically: "Lindemann does not disclose the use of unique user codes to select between multiple RF signals, does not discuss the problem of interference caused by multiple CDMA transmission sources in proximity of a CDMA receiver, and therefore does not discuss utilization and capture of unique user codes to select between multiple RF signals." These limitations are not positively recited in the claim and thus cannot be given weight. The arguments are therefore rendered irrelevant.

Appellant states regarding claim 28 in section 4:

> As to Claim 28, Lindemann is directed to a "digital wireless loudspeaker system" with surround sound Capability. Thus, modifying Lindemann to incorporate the teachings of Lindemann as modified by Sato (Schotz and/or Roberts) into a headphone set is basically using Appellant's own disclosure.

Examiner respectfully disagrees. The combination is directed to a zone distributed speaker system. It is notoriously well known in the art to substitute headphones where a speaker is located. Thus, the combination would still provide zone distributed music, but in place of the speaker, a headphone would be present. It is also notoriously well known that speakers include a headphone port. Modifying or substituting speakers for headphones in this manner is notoriously well known. It cannot be said that it is using Appellant's own disclosure as headphone and speaker substitution and modification was known **well before** 20 December 2001.

Appellant further states regarding claim 28 in section 4:

> Furthermore, such a modification destroys the heart of Lindemann's invention (primary reference) and its intended operation, which is to disperse multiple speakers with speaker groups in different rooms as well as provide a "full complement of six surround sound speakers."

Examiner respectfully disagrees. the combination still operates as a zone distribution system if a headphone system is substituted. Further, the system is not required to have a full 6 speaker surround sound system. Paragraph 66 shows a stereo surround sound set up. Headphones with left and right channels are notoriously well known.

In **section 5** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lindemann, Sato and Benthin should be reversed.

Appellant states in section 5 that the combination does not disclose "the receiver utilizes embedded fuzzy logic to enhance detection of the unique user code in said transmitted DSSS signal."

In support of this argument, Appellant submits that Lindemann does not require a unique user code, thus there is no need to use fuzzy logic to enhance detection of the unique user code.

Examiner respectfully disagrees. The unique user codes are met by the status messages as shown above in section 4 subsection 2. Since it is shown that the unique

user codes are taught, it cannot be argued that the combination fails due to their absence.

In **section 6** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lindemann should be reversed.

Appellant states in section 6 regarding claims 41 and 42:

> Additionally, there is no suggestion to make the transmitter of Lindemann "battery-powered," as claimed in Claims 41 and 42.

Examiner respectfully disagrees. Substituting power sources, i.e. wired or battery powered, is notoriously well known in the art. It would have been obvious to one of ordinary skill in the art to try to modify the combination to produce a receiver using battery power. It is even further likely that this would have been obvious to try since it was a wireless transmission system. It would be likely that one would want to remove all of the wires from the system.

In **section 7** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lindemann should be reversed.

The arguments regarding claims 51 and 52 are met by the above statements regarding the unique user code and the private listening.

Appellant further states:

> On page 13 of the FOA, Appellant observes that when rejecting Claims 43, 44 and 49-52, the Examiner relies on the rejections provided for 19, 27 and 30. However, Claim 30 is not rejected under Lindemann in view of Sato (Schotz and/or Roberts).

Examiner would like to note that a typographical error was present in the Final rejection on page 13. Specifically claim 30 was used to meet the limitation of claims 43, 44 and 49 - 52. However, the entire rejection was not meant to be used, but rather the features taught by Lindemann present in the claims (i.e. at least one module adapted to amplify said generated audio output).

In **section 8** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lindemann, Sato and Benthin should be reversed.

The arguments regarding claim 53 are met by the above statements regarding the unique user code and the private listening.

In **section 9** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lavelle should be reversed.

Appellant states in regard to claim 54:

> First, in Appellant's Claim, the connection of the audio source and the transmitter via a headphone plug/jack is positively recited. Appellant observes that the transmitter and receiver of Lavelle are intended to be installed in a vehicle and would generally be permanent fixtures in the

> vehicle. The transmitter 510 in Lavelle, is arranged to communicate with wireless headphone sets via CDMA. Hence, in Lavelle, there is neither an existing analog headphone plug/jack, as claimed, nor a need for one. More importantly, Lavelle has no need for a headphone plug/jack since the original configuration of the primary reference (i.e. Lavelle) seeks to provide wireless communications in a vehicle (obviating the need for a headphone plug/jack to connect the headphone).

Examiner disagrees with the statement that there is no need for an analog headphone jack in Lavelle. First, Lavelle recognizes that the input devices 190 are merely illustrative and other devices may be employed in accordance with the invention; col. 4 lines 35-40. Lavelle shows an external audio device section that receives external audio/video signals; Element 124 and col. 5 lines 30 – 37. Lavelle does not disclose a headphone jack specifically, but headphone jacks were notoriously well known at the time of the invention. Portable CD players, TVs and DVD players typically include this jack and are taught to be known by Lavelle. Thus, there is a need, contrary to Appellants statements.

Appellant further states in regard to claim 54:

> Nonetheless, even assuming that Lavelle may be modified with a headphone plug/jack, there is no teaching in Lavelle to further remove the transmitter 510 from the vehicle and couple this "transmitter" via a headphone plug/jack (which is not even present in Lavelle). Nowhere in Lavelle is such an arrangement described, especially since a headphone plug/jack does not exist in the first place. Hence, it appears that the Examiner is rejecting Appellant's invention in hindsight, using Appellant's own disclosure.
>
> Appellant further observes that the transmitter 510 of Lavelle is battery powered by virtue of its installation in the vehicle and connection to the vehicle's battery source. Thus, for Lavelle's transmitter to utilize the charging (battery) system of a vehicle for power, it is necessary to connect the entertainment unit and transmitter by cable or cord to the charging

> (battery) system. Hence, removing the transmitter 510 from the vehicle's battery source destroys the transmitter's ability to use the vehicle's battery source relied upon in the Examiner's rejection on page 17 of the FOA.

Examiner respectfully disagrees with this allegation. It is unclear why it must be necessary to remove the transmitter from the vehicle as it appears Appellant is attempting to state. Modification of the system would not require removal from the vehicle, rather modification would alter plug 124 to accept an analog headphone jack. No removal would be necessary as the device would remain fixed, and clearly 124 would be accessible without removable as Lavelle discloses that external units can be used as inputs. A user must have access to this input, else one would not be able to input another device.

Appellant next discusses the differences between a typical vehicle battery and a typical portable player battery. Appellant states specifically that "Lavelle does not contemplate use of a portable battery-powered type, and thus Lavelle does not disclose the use of a portable battery-powered transmitter for use portable system."

However, the use of a portable battery-powered transmitter for use in a portable system is not required as the claim is not limited at all to any portable system. Furthermore, a portable battery is not required, only a battery-powered transmitter. Finally, while a vehicle battery is given, the specifics of Appellants battery are not claimed. Any battery meets the battery disclosed by Appellant since specific details are not given. While power provided by car batteries and portable device batteries may

differ, it is clear that there are power regulators and transformers used to supply the power necessary to the transmitter device of Lavelle.

Appellant further states in regard to claim 54:

> Additionally, while Lavelle employs CDMA communications between the transmitter and headphone, Lavelle does not teach a unique user code, as claimed. In the CDMA embodiment of Lavelle, Walsh code generators and PN (pseudo random number) generators are described. However, while these generators produce a code, such a code is designed to change. Thus, Lavelle codes are not "unique" user codes.

Examiner respectfully disagrees. These PN generators are not meant to read upon the limitation of the "unique" user codes. As stated in the FOA, the specific carrier frequencies are meant to read upon the unique use codes. Each user has a headset that will be tuned to a specific carrier frequency to listen to the audio. Since this is set by a user, and the frequency is supplied by the receiver to transmit the audio, it is a unique user code.

Appellant further states in regard to claim 54:

> Appellant observes that Lavelle provides multiple headphone sets in a vehicle and intends to minimize interference between the headphone sets [Lavelle 6,678,892 column 6 lines 43 - 45 "...the wireless signals may be encoded to prevent interference between the two wireless headphone sets 152, 154."]. By contrast, Claim 54 recites "... CDMA communication ... provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space." Each wireless digital audio music system consists of a CDMA transmitter and a CDMA receiver headphone; hence, interference between a particular CDMA receiver headphone of a wireless digital audio music system and the CDMA transmitters of other wireless digital audio music systems, in a shared space, is eliminated.

> Lavelle's CDMA embodiment does not address interference between a headphone set and many transmitters simultaneously sharing the same space. Additionally, Lavelle also does not "provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space," as claimed. Furthermore, Lavelle does not use a unique user code.

Examiner respectfully disagrees. Lavelle is directed to reducing interference in a CDMA system as explicitly stated in col. 7 lines 25 – 35. Lavelle may not explicitly disclose multiple transmitters. However, this limitation does not need to be met as it is not sufficiently claimed nor disclosed. Further information regarding the multiple transmitters limitation is provided above in section 2/3.

Appellant further states in regard to claim 54:

> Lavelle also does not "provide a particular user with private audio reproduction free of interference from other users of other wireless digital audio music systems in a shared space."

Examiner respectfully disagrees. Lavelle does precisely this, in the same manner as taught by Appellant. Lavelle teaches" providing a particular user (user of headphone 152 or 154) with private audio reproduction (private by virtue of the headphone use, and specifically argued as private within Appellants appeal brief) free of interference from other user of other wireless digital audio music systems (Lavelle wishes to reduce interference between the users; col. 7 lines 25 – 35) in a shared space (both users in a vehicle).

Appellant further argues in section 9 about and "multiple transmitter" limitations.

Appellant states for example:

> "Appellant's invention uses multiple transmitters, where each transmitter outputs data packets in a stream."
> "Because Lavelle's CDMA embodied system contains only one transmitter, it does not address headphone receiver interference due to many same transmitters simultaneously sharing the same space."
> "Lavelle's system differs from Appellant's invention because all signals in Lavelle originate from a single stationary transmitter."
> "As stated earlier, Lavelle only utilizes a single transmitter. Therefore, Lavelle does not deal with interference that could result from multiple transmitters and multiple receivers, whereby each transmitter transmits to each respective receiver in a shared space."
> "Lavelle never mentions or suggests that his CDMA design accounts for multiple similar CDMA transmitters operating in the same space."

**However, while these arguments may point out differences between the cited references and Appellants inventions, it is neither claimed nor sufficiently disclosed.** (emphasis added as this seems to be a recurring contention with the arguments).

In **section 10** of Appellants arguments, Appellant submits that the rejections under 35 U.S.C. 103(a) in view of Lavelle and Benthin should be reversed.

The arguments in section 10 are directed to the device of Lavelle not disclosing unique user codes and thus there is no reason to use fuzzy logic. This is not

persuasive for the same reasons as shown above. Namely, the teaching of the unique user code is present and thus there is a reason to sue the fuzzy logic.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Andrew C Flanders/

Conferees:

/Sinh Tran/

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/Vivian Chin/

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